

PATENT ABSTRACTS OF JAPAN

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(54) HIGH DENSITY THIN WOVEN FABRIC

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a high density thin woven fabric made of cellulose spun yarns, which has specific physical properties, does not have such a glaring appearance and slipperiness as polyester multi-filaments and dry and rough touch like cotton, has a natural appearance and gloss, is soft and lightweight, and is down-free.

SOLUTION: This soft and lightweight high density thin woven fabric scarcely blowing out the down contains regenerated cellulose fibers in an amount of 43% to 63%, has a warp-weft cover factor total CF: $2,600 \geq CF \geq 2350$, and comprises (A) polynosic or lyocell spun yarns preferably having a single filament fineness of ≤ 1.4 dtex and (B) polyester multi-filaments having a single filament fineness of ≤ 0.8 dtex.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]It is soft, and there are not KASATSUKI of cotton and a feeling of Hari, and there are not a feeling of a flash of polyester multifilament and a slide, and it has natural appearance and gloss, and is related with the lightweight regenerated cellulose system high density thin ground textiles which can be used without the inside bag for preventing blow off of a down.

[0002]

[Description of the Prior Art]As for the cloth for down proofs used for outerwear or a bedding side fabric, cotton fabrics are generally used. Many superfine polyester multifilament which was excellent in functionality on the other hand in recent years from fields, such as software, a light weight, saposhnikovia root nature, high water repellence, and high robustness, nylon multifilaments, or those compound synthetic fiber raw materials in a coat, a blouson, golf, outdoor wear, etc. are used. However, in multifilament, a cloth surface cannot wipe away metallic gloss and a feeling of slime from a finish-machining side smoothly from the regular nature and precision, but when it is considered as that natural cloth appearance is missing and a bedding side fabric, it has the fault of being easy to slide down cloth during sleeping.

[0003]moreover -- while thin ground lightweight textiles are easy to be obtained from the compactness -- cloth -- ***** -- easy -- it also has the fault that a down and a feather project easily from cloth.

Although the thin denier of 0.8 or less dtex generally has poor spinning nature although natural cloth appearance can be expressed with polyester cotton yarn textiles, and the swelling of cotton yarn is obtained, about the same soft hand as multifilament is hard to be obtained. The soft textiles which were rich in gloss and color enhancement by especially cotton having deep-rooted demand also historically as an object for bedding side fabrics, and adding mercerization to fine count textiles are possible. However, although KASATSUKI peculiar to cotton in hand, and Hari and a feeling of the waist remain and it succeeds in the hand improvement by breaking processing etc., the actual condition is that about the same sufficient soft hand as superfine multifilament textiles is not obtained.

[0004]On the other hand, although it succeeded in the trial using rayon cotton yarn for the purpose of

the hand improvement of cotton or polyester cotton yarn, and the hand has improved soft, since rayon thread was extended at the time of wash, the permeability and wash contraction after wash fell remarkably, the down blew off easily, and it was completely impractical. Even when not washing, the fall of the permeability by repetition of moisture absorption and desiccation of fiber is intense, and lacks in endurance. Furthermore, in order that resinating for shape stability grant may spoil a hand remarkably and may reduce cloth strength, it has not resulted in fertilization. For this reason, the bag needed to be used while wrapping the down, in order to prevent blow off of a down, if it is going to obtain a soft hand peculiar to rayon. However, by this method, it becomes a cost hike of a product, and also the weight of the whole bedding spoils the amenity at the time of increase and sleeping. the thin ground which there is no jarring feeling of KASATSUKI peculiar to such a background to cotton, is soft, and is excellent in the amenity at the time of sleeping -- lightweight densely textured fabrics were called for.

[0005]

[Problem to be solved by the invention] There are neither a feeling of a flash of polyester multifilament, nor a slide and a feeling of KASATSUKI of cotton, and the soft and lightweight high density thin planimetric features which have natural appearance and gloss are provided.

[0006]

[Means for solving problem] As a result of inquiring wholeheartedly in view of such a background, it resulted in this invention. Namely, the cloth weight which contains less than 63% not less than 43% 1. raw cellulosic fiber (A) below by 110 g/cm^2 . With the textiles whose drape coefficient is less than 0.355 The permeability after one wash of **** and these textiles is less than $3.00 \text{ cc/cm}^2 / \text{second}$. As a certain high density thin ground textiles and 2. regenerated cellulose system fiber (A), In the fiber strength in a damp or wet condition, 2.5 or more cN/dtex and ductility 15.0% or less, 0. Under 5 cN/dtex too heavy Ductility is [humid stress] 0.9 or more cN/dtex at the time of 4.0% or less and 5% extension. Fiber, It is ** about using a polynosic fiber or RIOSERU fiber especially. High density thin ground textiles considered as the mark, 3. The sum of the cover factor of the warp of textiles and the woof shown with a following formula is less than [2350 or more] 2600, High density thin ground textiles (formula 1), wherein the finish densities of the woof of textiles are it of warp, and more than equivalent, Cover factor $CF = \text{let the warp density (inch/)} \times (\text{warp ****})^{0.5} + \text{woof density (inch/)} \times (\text{denier fineness})^{0.5}$ spinning yarn count be a DESHITEKKUSU reduced property. ** this inventions are constituted.

[0007]

[Mode for carrying out the invention] This invention is explained in detail below.

Regenerated cellulose system cotton yarn (A) : The fiber strength in a damp or wet condition in regenerated cellulose system fiber 2.5 or more cN/dtex, In ductility, the ductility under 0.5 cN/dtex too heavy uses the regenerated cellulose system fiber which humid stress equips with the characteristic of 0.9 or more cN/dtex 15.0% or less at the time of 4.0% or less and 5% extension. The polynosic fiber provided especially in Household Goods Quality Labeling Law or RIOSERU fiber which is fiber

outside specification is suitable. In this invention, No. 55 count [more than] fine count cotton yarn is [English cotton yarn number / No. 50 count / more than] preferably required because of a weight saving. 1.1 or less dtex is [that it is easy to be spinning nature] therefore, still more preferably preferred [single yarn fineness] 1.2 or less dtex preferably 1.4 or less dtex. Especially, in the high-class yarn counts, such as No. 80, the amount of the composition number of cotton yarn serves as thread strength and grace, and influences weaving nature and textile grace. It is desirable from the field of a soft hand and permeability. In a single yarn denier, in 1.5 or more dtex, spinnable properties and weaving nature of a fine count get worse, and quality lightweight thin ground textiles are no longer obtained. As a result, the permeability which specifies down blow-off prevention performance is not obtained. These cotton yarn (A) is used for either warp or the woof in order to obtain natural cloth appearance, a glossy sense, and a soft hand. Although rayon has characteristic variant sectional shape from the difference of a fiber process, it is the feature that fiber of this invention generally has round sectional shape, and silkier gloss and high color enhancement can be provided.

[0008]The weight ratio in the cloth of regenerated cellulose system fiber (A) may be not less than 43% and less than 63%. In less than 43%, in order that the influence of the raw material which carries out union, especially polyester fiber may come out strongly, neither the natural appearance of regenerated cellulose system fiber nor the soft hand accompanied by some resilience is obtained. At not less than 63%, the dimensional change by the temporality of regenerated cellulose system fiber becomes large, down blow-off tightness is inferior, and it is not desirable.

[0009]Regenerated cellulose fiber (A) and the fiber (B) which carries out union have dimensional stability and evapotranspiration nature to preferred polyester. As compared with multifilament yarn, a hand becomes rough **, and alkali loss in quantity is required for polyester cotton yarn because of pilling prevention, it has the disadvantage which makes a densification check, and is not preferred. However, use of the mixed yarn of polyester and regenerated cellulose system fiber is preferred, and it is desirable to make into not less than 50% the blended ratio of the regenerated cellulose system fiber occupied to thread in that case, and to make a hand make it soft.

[0010]Use of polyester multifilament yarn is the most preferred from fields, such as software, a light weight, dimensional stability, and permeability, as fiber (B) thread which carries out union. in that case, 80 or less dtex and polyester multifilament yarn of 1.0 or less dtex of single yarn fineness -- these temporary twist finished yarn is used preferably. In 80 or more dtex, cloth becomes thick, does not become lightweight and is not preferred. They are 70 or less dtex preferably. 1.0 or less dtex of single yarn fineness [0.8 or less dtex of] are 0.6 or less dtex still more preferably preferably. In 1.0 or more dtex, a hand hardens and permeability is hard to be obtained. (B) It may pass through thread and it may be used for any of **, when using polyester multifilament yarn for the woof, the natural appearance of warp (A), gloss, and a hand can be emphasized, and in warp use, thin denier thread can be easily used from the strength. As a result, since there are few warp pieces, weaving nature is also good, and there is the feature from which textiles it is thin and soft and lightweight are obtained easily. The blended ratio of polyester is made into 70% or less in order to obtain a soft hand. In order that the polyester fiber which passed through the press heat treatment process for obtaining

permeability may emit the gloss like metal and also a hand may harden, it is not desirable at more than this.

[0011]A down bedding side fabric generally has many satin organizations about cloth weight, and many of such weight are more than 130 g/m^2 . It is possible that the gloss of cloth is easy to be acquired as a Reason many satin organizations are used, to be advantageous to down blow-off tightness from the thickness of cloth, etc. In this invention, below 104 g/m^2 makes [below 110 g/m^2 / below 108 g/m^2] it still more desirable preferably. Therefore, although Aya may be sufficient for an organization, lightweight nature and a cost aspect to a HIRA organization is fitness more.

[0012]In order to improve down blow-off nature, cover factor CF shown with a following formula is made into less than [2350 or more] 2600. It is 2360 or more and less than 2560 preferably. Although CF serves as a soft hand by less than 2350, down blow-off tightness becomes poor and is not preferred. Conversely, ***** and weight increase and it is not desirable at 2600 or more.

(Formula 1) Let bar factor $CF = \text{warp density (inch/)} \times (\text{warp *****})^{0.5} + \text{woof density (inch/)} \times (\text{denier fineness})^{0.5}$, however the spinning yarn count be DESHITEKKUSU reduced properties.

[0013]Under the present circumstances, it is a light weight of this invention, and a desirable method of it being soft and acquiring the low permeability effect that the finish density of the woof of textiles has it of warp, thread which is more than equivalent, and density composition. This has a limit in fine-size-ization of cotton yarn, when regenerated cellulose system cotton yarn is used for warp and polyester multifilament is used for the woof, but. It is for obtaining fine-size thread more easily than cotton yarn, and tending to give pliability to textiles with the thread form of the state near non-twisted thread or a soft-twist thread, or non-twisted thread of a weak confounding thread form, since multifilament is usable. It is for there being an effect which raises the blended ratio of polyester, maintaining the cloth construction binding force over temporality stably, and contributing to low permeability-ization.

[0014]The permeability after wash of the cloth of this invention sets less than 3.00 cc to less than 2.70 cc preferably. physical [as a product / under use] in the permeability after wash being not less than 3.00 cc in the case of lightweight thin ground textiles -- rub, and by **, moisture absorption of a cellulosic fiber, repetition of desiccation, etc., a cloth size changes or cloth organization binding force declines -- a down -- a cloth surface -- ejection -- it is not desirable. For this reason, as for the initial permeability of cloth, 0.90 cc or less is preferably preferred 1.00 cc. More than this means that a down blows off from a cloth surface by short use. Therefore, in order to improve endurance like this invention, the permeability of the cloth before and behind wash is low, and it is important that it is stable.

[0015]Since a hand is spoiled while a densification makes permeability improve, in this invention, calendar heat treatment after finishing is set up in the range (150 ** or less is a rule of thumb) which does not stiffen the hand of polyester, During the breaking processing by a jet dyeing machine etc., or after processing, alkali weight loss treatment of several percent and enzyme loss in quantity may be given, or it may nap. Breaking finish processings, such as grant of a softening agent, and a SANFO rise, a cam fit, are also effective. Drape coefficient of textiles Less than 0.355 are desirable, and also

less than 0.350 are desirable. It becomes *****, or cloth becomes thick, and it is not desirable at more than it.

[0016]As a conventional use, the high density thin ground textiles obtained by this invention The cloth for down proofs, saposhnikovia root nature, and pliability, such as a bedding side fabric, It can use for woman garments, nightwear **, etc. which employed efficiently the others and drape hand which is a coat, a blouson, golf, outdoor wear, etc. which employed lightweight nature efficiently, and lightness, such as a blouse, a jacket, and a skirt board.

[0017][Example] -- an working example explains this invention hereafter.

Valuation method: The permeability JIS L1096-1999-A method (fragile form method)

The drying method JIS L1096-1999-line dry drape coefficient JIS L1096-1999-G method after the washing method JIS L 0217-1995-103 method wash (drape coefficient)

Table 1. Raw cotton physical properties and the cotton yarn yarn count [0018] of regenerated cellulose system fiber (A) which were used for working example and comparative example It finished weaving by the thread composition and gray-goods density which are shown in Table 2 using the raw cotton and cotton yarn which are shown in Table 1. The cloth which includes this cloth for polyester after 80 ** desizing scouring [for 30 minutes] relaxed with a jet dyeing machine performed the dry heat set for 180 ** 30 seconds, after giving 2% of alkali loss in quantity. Subsequently, the high voltage jet dyeing machine performed disperse dye dyeing for 130 ** 20 minutes, and 60 ** dyeing for 20 minutes was succeedingly performed by reactive dye. Finish processing was performed after performing nap-raising processing of 600 meshes after that. Subsequently, the temperature of 130 **, the pressure of 40 t, and fabric speed calendering for /of 12 m were given. The density of those cloth, a blended ratio, a metsuke, a hand, a drape coefficient, permeability, and a comprehensive decided result are shown in Table 1.

[0019]

[Table 1]

	ポリノジック		H. W. Mレーヨン
	1.1dtex38mm	0.8 d t e x 38mm	0.9dtex38mm
湿潤強度 (cN/dtex)	3.1	3.0	2.5
湿潤伸度 (%)	13.0	11.0	25.0
0.5cN/dtex 荷重下湿潤伸度 (%)	2.6	2.5	4.0
5 % 伸長時湿潤応力 (cN/dtex)	1.2	1.2	0.7
紡績糸番手 (英式、縺係数 3.6)	60'	80'	60'
使用区分	実施例2, 3, 4 比較例1, 2, 3, 7	実施例1, 5	比較例4

[0020]In evaluation of permeability, from the use examination evaluation result [it is based on ten persons as a actual down proof bedding side fabric by the working example 2 and the comparative examples 1 and 2] for six months. The permeability of the plain weave fabric which has down blow-off

prevention performance (there is no blow-off number of a down feather, or small) grasps and evaluated that it was less than $3.00 \text{ cc/cm}^2 / \text{second}$.

[0021] It is necessary to compare a plain weave fabric with satin, and it needs to set up early permeability low understand by the working example 1-5 and the comparative example 1. Since contraction by swelling and desiccation of fiber at the time of wash is large, the organizing point of cloth moves, and this is guessed for permeability to fall. Since ***** is still higher, the comparative example 4 has wash and a large dimensional change by desiccation, and is guessed to be easy to produce a void in cloth. Although the down blow-off prevention performance was excellent in the comparative example 5, a feeling of a dryness peculiar to cotton did not disappear, but the drape coefficient of the hand was poor. The comparative example 7 was a hand which whose metal Mr. gloss of polyester is conspicuous, lacks in natural appearance, and has a feeling of Hari. The comparative example 6 has heavy cloth, has the feeling of a stock near the satin of the comparative example 1, and is inferior to lightweight nature. As compared with these, each working example showed the result of having excelled in a hand, a light weight, and down blow-off tightness.

[0022]

[Table 2]

	実施例 1	実施例 2	実施例 3	比較例 1	比較例 2	比較例 3	比較例 4	比較例 5	比較例 6	比較例 7
経糸	Po 80'	Po 60'	E 55	Po 60'	Po 80'	Po 60'	Po 80'	Po 80'	E 55	E 55
緯糸	E 78	E 78	Po 60'	E 78	E 78	E 78	E 78	E 78	Po 40'	E/Po 60'
組織	平	平	平	5枚糸子	平	平	平	平	平	平
密度	154	137	164	204	137	111	137	137	164	164
生 織	125	125	118	170	115	125	125	125	107	118
仕 織	162	145	172	211	145	121	145	145	172	172
上 織	125	125	124	171	118	126	126	126	112	124
CF	2504	2550	2505	3602	2462	2313	2550	2550	2638	2505
目付(g/m2)	99	107	68	140	104		107	107	118	107
退 色	ポリソック	54	58	52	59	60	51		60	18
車 間	ポリソック	46	42	48	41	40	49	42	40	82
(%)	伸							58		
レーヨン							51			
通気 初期	0.49	0.53	0.9	1.44	1.42	2.01	0.68	0.51	0.66	0.72
度 洗濯後	1.99	2.15	2.46	2.36	3.10	4.29	5.60	1.68	2.11	1.43
ドレープ係数	0.347	0.351	0.340	0.364	0.342	0.338	0.350	0.483	0.378	0.481
風食性評価	ソフト	ソフト	ソフト	ソフト	ソフト	ソフト	ソフト	ソフト	ソフト	ソフト
総合判定	○	○	○	△	×	×	×	×	△	×

notes 1) Po expresses the "tough cell" by polynosic Toyobo Co., Ltd., E expresses polyester false twisting thread, 78T expresses 216f (=0.36 dtex/f), and 55T express 144 f (=0.38 dtex/f). As for Ry, CF is cover factor table ** about H.W.M (high wet modulus) rayon.

notes 2) As for 80', 73.7dtex and 60' set to 98.3dtex, and 40' sets yarn count conversion to 147.5dtex.

notes 3) A unit is density. A book/inch, and permeability express $\text{cc/cm}^2 / \text{second}$.

notes 4) The woof of the comparative example 7 depends polynosic 1.1T38mm35% and 1.2T38 mm of polyester 65% of mixed yarn notes 5 synthesis judging on the following standards.

O x heavy although a hand and permeability, and the lightweight nature of a good ** hand and permeability are good xx which is inferior in permeability, a hand, and a glossy surface [0023] which is remarkably inferior in permeability

[Effect of the Invention] according to this invention, although there is no feeling of KASATSUKI like

cotton and it has soft and silky gloss, since shape stability is missing, an inside bag is needed -- rough -- new practicality was able to be given to the regenerated cellulose system fiber with which only the dense bedding side fabric was presented. That is, a weight saving and down blow-off prevention performance were realized by specifying use fibrin material and a textile standard in the specific range, without [though regenerated cellulose system fiber is used, without it uses the special resins for giving form stability, therefore] spoiling a soft hand. As a result, it became possible to make an inside bag unnecessary, and was able to be considered as thin ground densely textured fabrics excellent in the good sleep amenity.

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CLAIMS

[Claim(s)]

[Claim 1]High density thin ground textiles, wherein cloth weight is textiles which contain less than 63% for regenerated cellulose system fiber (A) whose drape coefficient is less than 0.355 not less than 43% below by 110 g/cm² and permeability after one wash of these textiles is less than 3.00 cc/cm² / second.

[Claim 2]Fiber strength in a damp or wet condition which uses regenerated cellulose system fiber (A) 2.5 or more cN/dtex, The high density thin ground textiles according to claim 1 whose ductility is characterized by ductility under 0.5 cN/dtex too heavy being [humid stress] 0.9 or more cN/dtex at the time of 4.0% or less and 5% extension 15.00% or less.

[Claim 3]The high density thin ground textiles according to any one of claims 1 to 2, wherein regenerated cellulose system fiber (A) is a polynosic fiber or RIOSERU fiber.

[Claim 4]The high density thin ground textiles according to any one of claims 1 to 3 in which the sum of the following (formula 1) cover factor of warp of textiles and the woof is characterized by or more 2350 being less than 2600.

(Formula 1) Cover factor CF = let the warp density (inch/) x(warp ****) ^{0.5}+ woof density (inch/) x (denier fineness) ^{0.5} spinning yarn count be a DESHITEKKUSU reduced property.

[Claim 5]The high density thin ground textiles according to any one of claims 1 to 4, wherein finish densities of the woof of textiles are it of warp, and more than equivalent.

[Translation done.]